AMERICA'S ARMY PC GAME VISION AND REALIZATION

AMERICA'S A★A ARMY℠

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A Look at the Artistry, Technique, and Impact of the United States Army's Groundbreaking Tool for Strategic Communication

Produced by the **United States Army** and the MOVES Institute
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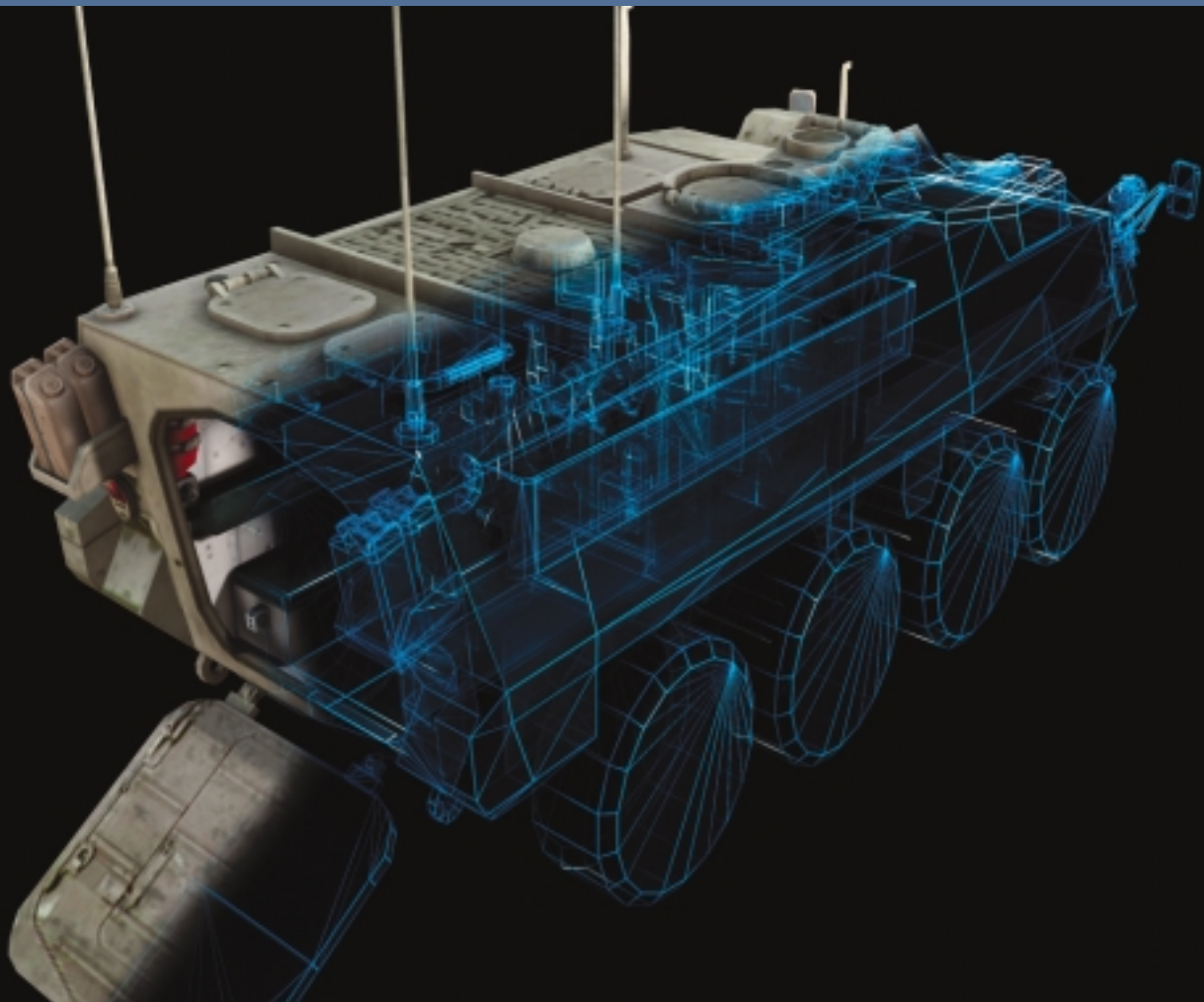
AMERICA'S ARMY, Breaking New Ground

By John P. McLaurin III

FROM THE OUTSET, WE SET A HIGH BAR FOR THE AMERICA'S ARMY GAME. THE GAME HAD TO PROVIDE AN ENGAGING AND CUTTING-EDGE CHANNEL FOR STRATEGIC COMMUNICATIONS WITH YOUNG AMERICANS AND THOSE WHO MAY INFLUENCE THEM ABOUT THE ARMY AND SOLDIERING. BASED UPON OUR RESULTS TO DATE, THE AMERICA'S ARMY GAME HAS EXCEEDED THE ARMY'S HIGHEST EXPECTATIONS.

THE GAME HAS OPENED ENTIRELY NEW CHANNELS FOR COMMUNICATING WITH AMERICA ABOUT SOLDIERING. IT HAS ALSO FOSTERED THE GROWTH OF A DYNAMIC COMMUNITY OF INTEREST IN THE ARMY THAT ENCOMPASSES HUNDREDS OF INTERNET FAN SITES AND COMMUNITY GAME HOSTS. IN THE PAST YEAR THESE VIRTUAL COMMUNITIES HAVE WITNESSED AN EXCHANGE OF INFORMATION ABOUT THE ARMY AND ITS GAME IN SEVERAL MILLION WEB-FORUM POSTINGS, WEB LOGS, AND INTERNET CHAT SESSIONS. THIS HAS PLACED AMERICA'S ARMY AT THE FOREFRONT OF ATTENTION OF YOUNG AMERICANS AND THEIR PARENTS AS A SOURCE OF INFORMATION ABOUT THE ARMY.

FROM THE GAME'S LAUNCH ON JULY 4, 2002 TO THE END OF NOVEMBER 2003, 2.4 MILLION REGISTERED AMERICA'S ARMY PLAYERS COMPLETED OVER 40 MILLION HOURS EXPLORING THE ARMY AND SOLDIERING. THESE EXPLORATIONS RANGED FROM VIRTUAL PARACHUTE JUMPS AT ARMY AIRBORNE SCHOOL TO MASTERING THE ABC'S OF LIFESAVING AT BROOKE ARMY MEDICAL CENTER. AMID THESE ADVENTURES, PLAYERS GAINED AN APPRECIATION FOR THE CENTRAL ROLE THAT VALUES AND TEAMWORK PLAY WITHIN THE ARMY. BASED UPON THE GAME'S STRONG BEGINNING, WE EXPECT TO BOTH BROADEN AND DEEPEN ITS COVERAGE OF THE ARMY IN COMING MONTHS AND YEARS. CLEARLY WE HAVE BROKEN NEW GROUND AND WE PLAN TO BUILD AMERICA'S ARMY ON THE STRONG FOUNDATION ESTABLISHED IN THE PAST YEAR.

__Mr. McLaurin__ is the deputy assistant secretary of the Army for human resources and executive agent of the America's Army *project*

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Up Close

Development, marketing, and distribution of the AMERICA'S ARMY game lie at the intersection of technological progress, opportunity, and innovation. The concept for the game, however, found its roots in economic theory. As students of economics learn, microeconomic theory is framed within a set of assumptions. Among these is the key assumption that economic actors make rational decisions based upon perfect information. Of course, economists understand that information is not perfectly distributed and that indeed, there may be considerable search costs associated with economic decision-making. In fact, Daniel Kahneman, the 2002 Nobel Prize winner for economics, pointed out that people tend to make decisions based upon information available in their immediate environment.

6

Special Forces Soldier wearing
DCU (desert combat uniform)
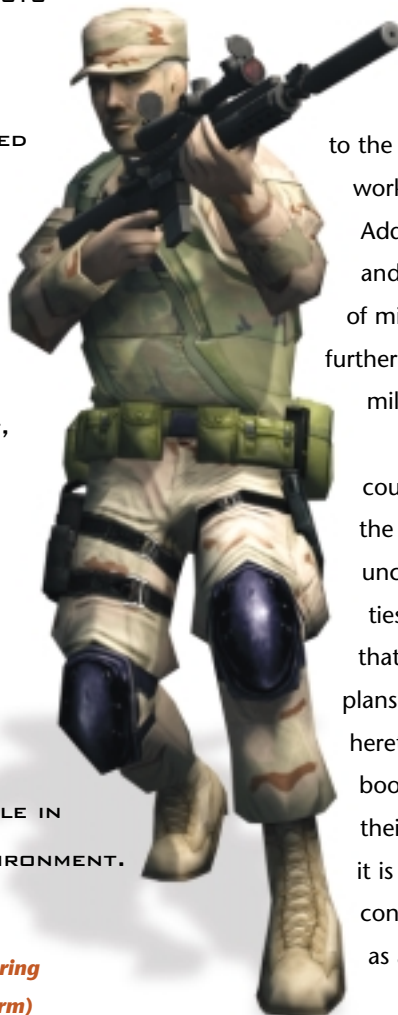
Informing Popular Culture

The AMERICA'S ARMY Game Concept

By Colonel E. Casey Wardynski, Ph.D.

With regard to the game, the importance of information-search costs (time, effort, and assimilation) and human decision-making behavior arise from second-order effects of the successful substitution of the all-volunteer force for the draft in the early 1970s. Specifically, at the end of the draft about thirty percent of the American labor force had served in the military. After leaving the military, these Americans re-entered civilian society as teachers, administrators, coaches, businessmen and other members of the labor force. In contrast today, due to the success of the all-volunteer force, only *one in ten* working Americans has ever served in the military. Additionally, since the end of the Cold War, force cuts and base closures have markedly reduced the presence of military forces throughout the United States. This has further reduced opportunities for vicarious insights into military service.

Hence, whereas in the past a young American could gain insights into military service by listening to the recollections or the advice of an older brother, an uncle, a father, or perhaps a neighbor, today opportunities for such insights are relatively scarce. To the extent that information about military service shapes the career plans of young Americans today, these decisions were heretofore influenced by movies, television, magazines, books and advertising. Put simply, these decisions have their foundation in the popular culture. Consequently, it is not surprising that young Americans with little to no contact with Soldiers are less likely to include Soldiering as a potential career.

To counter this situation, the game's originator

reasoned that the Army would reduce search costs by framing information about Soldiering within the entertaining and immersive context of a game. This approach would also greatly reduce the assimilation costs of such information. Indeed, an official Army game with high production values would garner the interest of the large population of young gamers. For these individuals, having had no tangible contact with Soldiers, a game would provide virtual experiences and insights into the development, organization and employment of Soldiers in America's Army. In this way, such a game would place the Army in an accessible format and familiar environment for young Americans. In so doing, the Army would gain increased salience in their life-course decisions.

Of central importance, within a game the Army would be able to demonstrate the interplay between Soldiering and values. The Army's cornerstone values of duty, integrity, honor, loyalty, selfless service, courage, and respect for others would shape player progression and game experiences. In this way, such a game would convey an understanding of the context within which our nation confers its sanction to Soldiers to employ force in defense of freedom. Moreover, through its role-playing capacity, this game would help players make connections between life-course decisions and life-course outcomes. Thus, a well-executed game would put the Army within

A Special Forces marksman carrying an SPR.

the immediate decision-making environment of young Americans. It would thereby increase the likelihood that these Americans would include Soldiering in their set of career alternatives.

In May of 2002, the Army debuted *America's Army* at the Electronic Entertainment Exposition (E3). In the intervening seventeen months since its launch, the game has placed Soldiering front and center within popular culture. It has met with overwhelmingly positive coverage by the media from the front-page of the *Los Angeles Times* to the homepage of America Online. Gamers have downloaded several million copies of *America's Army* and its upgrades. Moreover, magazines such as *PC Gamer*, *Computer Gaming World* and *Computer Games* have distributed over a million copies of the game CD as magazine blow-ins. Foreign interest has been equally impressive. Fan sites from Turkey to Japan have also distributed the game via download and CD. Due to its broad appeal, *America's Army* has found its way onto the computers of over 2.8 million registered users. As a result, a recent survey of the effectiveness of Army marketing and strategic communications found *America's Army* to be the Army's most effective medium for reaching young Americans. Indeed, the game engendered positive awareness of Soldiering among twenty-nine percent of young Americans age 16 to 24. Importantly, the game achieved these results at an expenditure of about one-third of one percent of the Army's total marketing budget. Consistently ranked among the top four PC action games played online, *America's Army* has exceeded our expectations and proven the value of games as a medium for informing popular culture about Soldiering and the Army.

Colonel Wardynski *is the director and originator of the* America's Army *project*

Special Forces to the Rescue

The scene below shows a Special Forces combat search and rescue mission, or CSAR; the Soldier is laying down suppressive fire. Their mission is to find the wounded pilot and destroy any top-secret equipment, including the downed Blackhawk. The enemy, concealed in surrounding buildings and alleyways, attempts the same. The gripping, hostile situation and the players' visceral desire to save their teammate creates strong tension and makes this an emotionally effective mission. While Soldiers' uniforms, armor and equipment are accurate standard issue, there is some variation with Special Forces "preferred equipment," so as not to look assembly line. For example, you and your squad members might have some random variations in eyewear, including Oakley, M-Frames, Juliets, or Combat A-Frame goggles, worn up or on. You might even get the prized handmade Randall knife.

James Abney, AA Designer/Programmer

When the Army decided to build a computer game as a communications device, use of the military as a gaming premise was tried and true, having been explored by industry for years. No need to reinvent the wheel, but only to hire master wheelwrights.

The Army did have a requirement: that the game be played absolutely straight, as an honest representation of the service, especially regarding ethics, codes of conduct, and professional expectations, and extending to accurate depiction of hierarchy, missions, weapons, equipment, uniforms, settings, discipline, tactics, procedure – in short, this was to be a game a platoon sergeant could play without wincing.

Making America's Army
The Wizardry Behind the U.S. Army's Hit PC Game

By Margaret Davis, Russell Shilling, Alex Mayberry, Phillip Bossant, Jesse McCree, Scott Dossett, Christian Buhl, Christopher Chang, Evan Champlin, Travis Wiglesworth and Michael Zyda

This square shooting obviated the usual marketing flurries. For one thing, the goal was modest: not persuasion, but education; the game didn't have to part a fool and his money, it had merely to be played. Second, *America's Army (AA)* was self-defining – that is, if a game were to give the player the experience of performing an infantryman's job, it would be a first-person action game with team play based on real missions (themselves inherently dramatic and easily adaptable), in which the primary design constraints are training prerequisites, the Army's code of conduct (including consequences for infraction), and a teen rating.

All parties understood that setting the right tone was key to avoiding public-relations disaster. The Army could not be perceived as celebrating trigger-happy Rambos, nor, by downplaying lethal force, be guilty of deceit and hypocrisy; must not pander to the testosterone of the demographic, yet must keep teens engaged; must avoid charges of jingoism, mesmerism, cynicism, cliché, exploitation of vulnerable youth, incitement to violence, or a hundred other incorrectnesses. In light of these constraints, the Army, having stated their objectives, had to invest a great deal of trust in the sincerity and comprehension of the civilian crew building *AA*. One postmodern excess and the game was up.

9

Drop your sword. An infantry squad bursts from a Stryker in the **America's Army** *online game.*

The technical front was assigned to Michael Zyda, director of the MOVES Institute, and a team was scouted. Here *AA* hit on very good fortune. Alex Mayberry, tapped for creative director (and subsequently executive producer), was the disaffected veteran of eight years in the industry. He knew how games were built and wanted to build them better; towards that end he handpicked a team as much for collaborative attitude as competency (see the roster at www.movesinstitute.org/team). The Army supplied Lt. Colonel George Juntiff as design consultant, an onsite proofreader for both particulars and look and feel, and made Soldiers available for interview. The MOVES Institute contributed a raft of master's and doctoral students (all of them military officers), whose emergent research, including streamlined graphics algorithms and analysis of the psychological dynamics of immersion, was piped into the game. They also licensed Epic Games' Unreal game engine as a foundation for the game's development.

Work began as Colonel Casey Wardynski and the designers roughed out the contents of the levels. The activities agreed upon were at once authentic, technically feasible, and fun – or made fun. Take the radio-tower mission: yes, Rangers would disable the tower in real life, but they might do that by blowing it up – which would be over too quickly in a game. Instead *AA* requires the player to find friendlies, take down terrorists, and safeguard foreign-aid

Special Forces Soldier on CSAR (combat search-and-rescue) mission

workers till the communications people can effect a takeover.

Missions the gamers thought exciting but the Army judged irregular were rejected, and elements the Army wanted but the team couldn't build to their own satisfaction were shelved for later. Thus, while a parachute jump is in the game, a beach landing is not, because recreating water's splash and flow is extremely hardware intensive. Similarly, ropes used dynamically in knotting and casting are currently more trouble than they're worth. But *AA* is continually under improvement and expansion. As the game engine evolves and consumer equipment improves, it will be possible to animate the Strykers (the Army's new armored vehicle) and other vehicles that players can presently climb into and sight and shoot from; for now, they would move too slowly, look too crude, and require too vast a background.

Medic training – all play and no work makes Jack a bad Soldier

The triumph of *AA* is that it manages to grip an action-oriented audience while insisting on a formal, educative structure. As every general started with basic training, so also in *AA* you earn access to online play by paying your dues in basic training (thus experiencing the Army's merit-based promotion) and qualify for good stuff like marksman, airborne, and medic through advanced classes. Basic teaches you to think Army-style (forget shooting your drill instructor) and provides a handy space for

learning how to maneuver before joining online play. The very pace of play, which is deliberate compared with other action games, reminds the player that the Army proper is *not* a game.

To convey Army core values (loyalty, duty, respect, selfless service, honor, integrity, and personal courage), *AA* rewards Soldierly behavior and penalizes rotten eggs. This works out in practical ways. In basic training, for example, you can opt to become a combat life-saver. Doing so reflects duty and selfless service, so you get points and expanded opportunities for going through training. Out on mission, your buddy collapses in front of you. You can attend him, which earns points for loyalty and honor, or keep running, which scrubs points. If you do stop, you become a target yourself, which takes courage, and if you're hit, your health will suffer, so you need the integrity to inform your actions with sound judgment. Doing your duty and saving both your lives wins the most points. Just like in combat.

For the first release (July 2002), ten levels were agreed on and a shopping list drawn. Over the two years beginning in May 2000, the team visited nineteen Army posts, including Ft. Benning (for the rifle range), Ft. Lewis (weapons), and Ft. Polk (vehicles and house-clearing operations). Besides photographing modeling and texture referents, shooting motion-capture video for animations, and recording thousands of sound effects, the team jumped from towers, submitted to dog attacks, even rode a Blackhawk helicopter at three a.m., watching the fireworks as live shells barraged the terrain below. These first-person encounters gave the team an enthusiasm and surefootedness that mere stock footage and cold data could not provide.

1.) Not just any rifle range: the prepared fighting position for firing-point nine on red-range one at Ft. Benning, Georgia 2.) The same view reconstructed in the game editor. The firing position is modeled with foxhole cover removed. 3.) The model imported into the editor and skinned. The white arrowheads are movie projector icons, used to cast shadows for trees. They are invisible during play. 4.) The range as seen in the game. Note that in the previous screenshots the red targets were lying behind black mounds. The script pops them up at the appropriate time.

1 1

(For the Special Forces release in 2003, the team called on Green Berets, including Captain Jason Amerine, an A-Team commander who fought beside indigenous forces in Afghanistan. *AA*'s deputy director, Major Christopher Chambers, also assisted, having witnessed combat operations in Afghanistan with the 20th Special Forces Group. Additional consultation was provided by the commander and training cadre of the JFK Special Warfare Center at Fort Bragg.)

Back home, the artists sorted through stills and b-roll, posting the likeliest to the network for perusal by the modelers and level designers. Virtual sets, consisting both of Army-post reproductions and fabricated hamlets and landscapes – together with hundreds of common and military assets – were built to translate reality into gaming levels.

Character modeling began with the assumption that the player will always see himself and his team as American Soldiers and his opponents as terrorists. He can choose from three skin tones (with vaguely concomitant facial features), but otherwise he's a young, midsized man, as is his generic and randomly complexioned enemy. As roles for women are added to the game, so also will female avatars. Players distinguish each other by dress, gear and weapons: the Americans in regulation uniforms, rucksacks, and helmets, the terrorists in black, drab, or tiger stripe, with perhaps bandannas

or caps. Both sides wear the paraphernalia appropriate to their weapons and combat roles, detail that is lost on many players, but which adds depth for the observant.

Extensive, continually updated weaponry is an *AA* distinction. Modeled from high-res orthographic shots with as much refinement as a 2,000-polygon budget permits, weapons are employed logically and strategically; a grenadier who tried to conduct himself like a sniper would suffer decreased combat effectiveness, as would a sniper shooting on the run. To ensure equal advantage, much investigation went into matching up rival weapons. Where the Americans employ M-16 assault rifles, for example, the enemy carries AK-47s, the nearest real-world equivalent, with the AK-47's higher caliber and firing rate duly reflected. You can capture and fire enemy weapons, which results in twisty visuals: if you drop your M-16, the other side sees you drop an AK-47, and if they pick up your weapon, they see it as an AK-47 and you see it as an M-16 that fires like an AK-47. This isn't a bug, but a conundrum proceeding from the premise that though you've captured a weapon with a faster firing rate, all your weapons will look American to you.

For animations, Soldiers were rigged with motion-capture sensors and filmed enacting common operations (see images 1 through 3 above). Procedures such as erecting a bipod or pulling and throwing grenades were performed strictly according to doctrine. The resulting sequences are truly tutorial – in fact, they've been used as such at West Point. Where absolute adherence to reality would bog down the game (e.g., if running or jam-clearing were depicted at true speed), animators relied on cropping and streamlining to reconcile veracity with the need to sustain excitement, stepping frame-by-frame through motion-capture video to identify key postures and weed out intermediate movement, allowing the eye to jump as with a flipbook. Artificial limitations on avatar range of motion were sometimes imposed to keep actions onscreen. In a reloading animation, for instance, the weapon is held at chest level (rather than dropping to midsection) and the hands stay clear of the player's view. The illusion of free and fluid sweep depends, in such cases, on confinement and restraint.

Augmenting his MOVES research in auditory psychophysics with expert advice from entertainment's top audio designers and engineers, *AA* sound designer (and naval lieutenant commander) Russell Shilling engineered the complex, multilayered sound that supports the game's immersive punch.
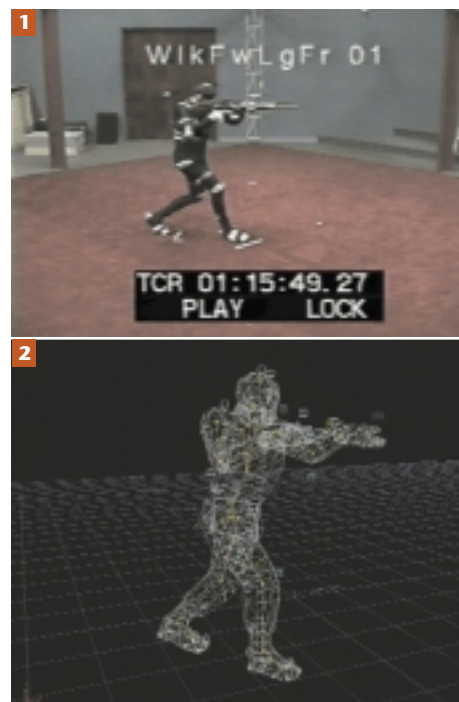
To determine the importance of audio in evoking emotion within videogames and simulations, Shilling's graduate students conducted research in three areas, with measures relying on objective rather than subject observations of performance enhancement. First, to ascertain the direct role of sound in creating presence and emotion, physiological responses (heart rate, respiration, electrodermal response, etc.) were measured. Auditory task analysis determined what sounds were requisite in the videogame for a realistic experience to occur. Finally, it was shown that by heightening emotional aspects of game play, performance on memory tasks is enhanced.

Professional techniques for sound mixing and enhancement were brought to bear, with sound effects, weapons foley, and ambient sounds custom recorded or obtained from professional libraries. Weapons animations, for example, are accompanied by detailed and accurate audio representations enhanced for visceral impact and perceived realism.

1.) Raw motion-capture video of a Soldier stalking with an M-4 2.) Editing the data in the motion-capture editor 3.) All dressed up and somewhere to go: skinned, equipped, and animated online

Footsteps, bullet impacts, particle effects, grenades, and shell casings are accorded texture-specific impact noises and room acoustics are represented using Creative Lab's EAX 3.0 technology.

In a typical *AA* firefight, bullets whiz and crack by the player's ear, slam into the wall behind, and tinkle concrete and glass fragments at his feet. The player hears his shell casings thunk off the wooden doorframe behind him and ping the concrete floor. Meanwhile, to the clatter of a nearby reload, the enemy creaks across a steel catwalk overhead. The player hears a flash-bang grenade scud off the floor behind him just before being incapacitated by the roar and ring of tinnitus in his ears. This scrupulous audio won the game prestigious Dolby Digital 5.1 Surround Certification and

approbation from industry reviewers.

In the realm of programming, realism was pursued through careful attention to game physics. When shooting, for example, the weapon sways slightly with the avatar's breathing, recoils on discharge, and occasionally jams. Bullets penetrate or ricochet depending on the makeup of the target (e.g., wood, adobe, dirt, glass, or steel), distance from target, and the weapon's caliber, type, and firing velocity. The target's composition also determines depth of penetration, and distance and angle of reflection. For naturalism, the spray patterns produced by multiple shots are randomized within a logical ambit so as to spread believably.

Realistic physics inevitably influence players' decision-making. For instance, because ricochets tend to travel along vertical surfaces, players learn to resist hugging walls if they want to stay healthy and combat-effective, and they don't detonate a blinding, deafening flashbang at close range if they value seeing and hearing. While it's faster and more fun to charge around shooting from the hip, *AA* gives big points for zooming in and aiming through the sights and rewards shooting from stable postures such as crouched and prone.

Mortal flesh can expire quickly in *AA*. If you're shot, fifty percent of your health is at risk: twenty-five percent up front plus another twenty-five percent that will drain away without medical help. If you are patched up, your combat effectiveness rises, because presumably you can still fire your weapon. As on the battlefield, friendly fire is an inevitable reality, and you can't escape its penalties.

Where reality is compromised, it's generally where literalness would give poor returns next to the engineering and byte-grinding involved. For example, straight vectors substitute for accurate ballistics in the case of fast-firing weapons like the M-16, where the eye can't follow bullet trajectories anyway; but for grenade launchers and other big, slow ammo, virtual gravity is switched on to create accurate flight paths, and shooters must aim accordingly. Similarly, sound fidelity loses out in the case of shellfire from a Stryker: whereas from inside the real thing you can't hear the gun's report, in the game, a big bang is just plain obligatory, and therefore dubbed in.

Because terrain datasets in the game were larger than normally supported by the Unreal engine, extensive research relating to terrain-rendering algorithms was conducted – but these algorithms were found unsuitable for

13

the system due to hardware requirements, task limitation, or inefficient memory management. These limitations were addressed by modifying the original terrain algorithm to include multiple levels of detail for complex terrain. This method raised new issues with projected and transparent textures and multi-resolution rendering; to address these concerns, the implementation includes special resolutioning techniques, and the Unreal world editor was modified to give world designers control of details.

Performance tests showed that these solutions afforded greater terrain complexity while maintaining interactive frame rates. Rendering times in environments with small terrains improved almost forty percent, while large complex terrain environments (km² at 1m resolution) fared even better.

As the project progressed, the Army realized the game had the potential for a much larger scope than originally conceived, including use of helicopters. Unfortunately third-person perspective helicopter physics were not included in the game engine nor in *AA*'s initial design. MOVES's thesis students employed Unrealscript to design a physics system that interfaces with the Unreal engine and interpolates smoothly among physics states within the bounds of helicopter capabilities and the appearance of realism. In testing,

Sunset at the oasis: a stormy AA *atmosphere. Engineered as a dome over the midground, AA's evocative skies convey depth and immensity. On clear nights, the stars twinkle faintly, as with great distance.*

fifty-three percent of subjects thought the helicopter physics were very or totally realistic, and seventy-two percent found them better than those on commercial graphics systems. In a follow-up study, eighty-six percent of participants found the helicopter physics equal to or better than those of a high-quality commercial 3D helicopter.

Like all games, *AA* suffers its share of soreheads and hackers among the players. To deal with bad behavior, the Army has contracted with commercial providers for round-the-clock server-administration coverage,

through which users can file complaints and call server admins to enforce civility. Within the game, major offenses such as shooting civilian targets or your own team, or in some cases destroying an objective you are charged to defend, trigger a non-negotiable sentence to Ft. Leavenworth. The *AA* programmers originally combated hackers and cheaters themselves, but subsequently unleashed commercial software to continuously detect hacked game files and lock offenders out.

AA's insistence on getting the Army right implies unlimited potential for expansion as the game evolves and occupations and missions accumulate. The game's fan sites (americasarmy.com/community.php) reveal diverse interest in both the game per se and as it relates to the real Army, an encouraging sign that an ever-wider range of individuals will sign on in future releases. *AA*'s achievement in building an online community will provide future opportunities for social scientists to study the correlation between game play, recruitment, and Army career success over the lifespan of the game.

Respect

Talk to the team, and you'll soon uncover their deep respect for the men they encountered in making the game. As lead designer Jesse McCree put it, "I never met real heroes before I started doing research into the Army for this game. I've spent time with guys who are ready to die for all of us. The best I can do is channel my respect for them into making something, in the medium I know, that honors their courage."

Besides adrenalinated reviews and features, *America's Army* continues to collect trophies, including *Action Vault's* "Debut Game of the Year," "Surprise of the Year," and honorable-mention "Multiplayer Game of the

Year;" *Frictionless Insight's* "Best Business Model (Developer) at E3;" *IGN* "Editors' Choice Award" for first-person shooters; *IGN's* "Biggest Surprise of E3;" *Gamespy's* "Best PC Action Game" runner-up; *Wargamer's* "Best of Show, first-person/tactical shooters;" *Well-Rounded Entertainment's* "Best of E3 2002;" *DoubleClick's* Insight Awards, honorable mention, "Best Multi-Channel Marketing Campaign;" *Academy of Interactive Arts and Sciences*, finalist, *PC First Person* "Action Game of the Year;" and *Computer Gaming World's* " Editors' Choice."

Ms. Davis *is the MOVES Institute's writer and webmaster. Lieutenant Commander Shilling researched and developed the sound for* AA. *Professor Zyda is the director of the MOVES Institute. Their co-authors are members of the* America's Army *development team (see inside back cover).*

Players aspiring to Special Forces are briefed on S.F. occupational specialties.

The U.S. military has long deployed games, simulations, and live exercises to train troops on specialized equipment, test strategic plans, and prepare for field operations. During the 1980s, computer-based simulations offered a way to reduce the cost of simulators for individual weapon systems (which could run into tens of millions of dollars) and at the same time link tanks, planes, and entire units for coordinated training. One of the biggest boosts to military wargaming came in the late 1980s, with the construction of the Defense Advanced Research Projects Agency (DARPA)-funded SIMNET, a distributed-networking project for simulating large-scale engagements.

Special Forces sandstorm. Limited visibility in a harsh desert environment makes for gripping combat in this old mud-wall village.

From Battle of 73 Easting to America's Army

By Tim Lenoir, Ph.D.

The value of SIMNET as a battle-training system became apparent in the aftermath of the Battle of 73 Easting, the most significant victory of the Gulf War. The Battle of 73 Easting took place on February 26,1991, just three days into the ground war, between the U.S. 2nd Armored Cavalry Regiment and a much larger Iraqi force. The location gave the battle its name: 73 Easting is the north-south coordinate on military maps of the Iraqi desert. Waged in a swirling sandstorm, the battle lasted from about 3:30 P.M. until dusk fell. The U.S. 2nd Calvary consisted of M1A1 Abrams tanks and M3 Bradley fighting vehicles. During the action, the cavalry troops, trained with computer-based simulations, destroyed fifty tanks, over thirty-five other armored vehicles, and forty-five trucks. More than 600 Iraqi Soldiers were killed or wounded, and at least as many captured. Immediately after the battle, Lieutenant General Fred Franks, the VII Corps commander, called the engagement a classic example of the cavalry mission to find, fix, and fight the enemy.

The potential of 73 Easting for transformation into a SIMNET project was recognized immediately. The charge was given to the Institute for Defense Analyses (IDA), a research-and-development center in Washington, D.C. IDA constructed a computer-generated "magic carpet" capability in the simulation, which could transport the viewer to any perspective on the field or even follow a moving vehicle in the action. Unlike earlier simulations (which only incorporated rote behaviors), *73 Easting* captured "soft" characteristics such as emotion and tension.

Based on battle-site surveys, participant interviews, recordings from radio nets, and Soldiers' own taped records during the battle, IDA generated a chronological experience of how individuals felt, thought, and reacted to the dynamic unfolding of events, rendering the action in a fully 3D, simulated reality that cadets could enter and relive. *The Battle of 73 Easting* was cited as fulfilling the original vision for SIMNET; using history to prepare for the future, it set the standard for training simulations.

The emphasis on simulation in the 1990s resulted in part from pressure for a fiscally efficient military at the end of the Cold War. The *Federal Acquisitions Streamlining Act* of 1994 mandated that the military acquire and adapt commercially available off-the-shelf technology rather than

contracting to build its own. During this decade, the commercial PC gaming industry evolved rapidly. Indeed, the growing market for PC and videogames drove improvements in the processing and graphics capabilities of personal computers. The US military was quick to adapt new videogame technology to its training and simulation needs.

In December 1996, the National Academy of Sciences, prompted by computer-science professor Michael Zyda of the Naval Postgraduate School in Monterey, California, hosted a modeling-and-simulation workshop to investigate the possibility of cooperation between the entertainment industry and defense. Zyda's report and follow-up proposal stimulated the Army in August 1999 to fund the Institute for Creative Technologies at the University of Southern California, supporting collaboration in applying entertainment software technology to military simulation, training and operations, and academic research. A few months later, the Army authorized Zyda to launch a game-development project at the MOVES Institute of the postgraduate school.

In building an immersive experience based on real-world events, the creators of SIMNET and the *Battle of 73 Easting* dreamed one day of having a flexible architecture capable of serving both as a rehearsal environment for a planned mission and as the interface with the command-and-control center of that mission-in-progress. By creating a training ground for multi-player missions based on real-world data, *America's Army* is very close to fulfilling the dream.

Professor Lenoir is co-chairman of the History and Philosophy of Science Program at Stanford University

When the history of late 20th-century cyber-technology is written, the evolution of military simulation will be a fascinating chapter. What historian could resist such a mix: virtual worlds, networked environments, societal impacts of game design and culture, the revamping of military technology and training?

Special Forces Soldier seeking an advantage

The Obstacle Course

Documenting the History of Military Simulation

By Henry Lowood, Ph.D.

Yet formidable obstacles loom. Military simulations represent a magnified version of the new and unsolved problems that software in general poses for archivists, librarians, and curators. First, the media and machines required to run programs are impermanent: they become obsolete, then rare. In addition, the very flexibility of software, which allows it to integrate media from previously discrete realms – texts, images, audio-visual experiences, interactive simulations, data processing – means that a variety of native files and software found in the simulation have also to be preserved. Archivists must consolidate not just source code and program-builds, but data such as art, e-mails, design documents, websites, and game replays into a new curatorial model amalgamating the traditional roles of archives, libraries, and museums.

In simulations such as *73 Easting* and *America's Army*, historians will not be content with static museum pieces or the mere ability to run old software. They will want to know what it was like to participate in these networked, multiplayer, simulated worlds – how player communities contributed to the experience, for example, and how simulations shaped player understanding of reality. Thus, it will be imperative that archivists secure rights towards a digital repository of captured game play.

Just as important as the simulations themselves is their context. The grail of realistic and compelling sims has led designers to amass huge databases of historical, cartographical, and physical data and consult with gaming and entertainment experts to create narrative and performance drama. In a simulation, history itself is data: striking examples include the embedded doctrine in the rules sets of Cold War strategic and theater-level simulations, the detailed battlefield data and Soldier interviews incorporated into *73 Easting*, and the replication of training sites and weapons systems in *America's Army*. And the personalities and institutions that built the software are also of note, because they inevitably find digital expression in the program as a whole. All these data partake of the same vulnerabilities that make preservation problematic in general. Which means historians and archivists have no time to waste.

Mr. Lowood *is the curator of History of Science and Technology Collections at Stanford University*

Character Models

As well as being accurately equipped and displaying a multitude of facial features, game characters exhibit eye and head tracking and lip synchronization. Note that random skintone assignment characterizes both U.S. and opposition forces.

Jesse McCree, AA Director of Development/Lead Designer

In the beginning ...

In the fall of 1999, we were in the early stages of forming the MOVES Institute, whose mission was to be basic and applied research in the grand challenges of modeling, virtual environments, and simulation. We had laid out a research focus in 3D visual display, networked virtual environments, computer-generated autonomy, human-performance engineering, immersive technologies, combat modeling and analysis, and defense/entertainment collaboration.

An AA "game face" unwrapped. Facial textures are applied to polygonal meshes and eyes and mouths are animated.

Does the Future of Modeling and Simulation have a Game Face?

By Michael Zyda, D.Sc.

These foci were selected as most relevant to the future of Department of Defense (DoD) modeling and simulation (M&S). The defense/entertainment collaboration was an outgrowth of my chairing the National Research Council committee that put out the report "Modeling and Simulation: Linking Entertainment and Defense." In 1999, defense/entertainment collaboration was sort of tacked onto our list of research areas – we knew the technology underpinning entertainment was similar to that required by DoD M&S, but we did not yet know if there would be a strong convergence or if there was anything of value there. Games seemed to have better computer characters than DoD simulations; they seemed better networked; they seemed more immersive than DoD simulations. But we did not know quantitatively. So we just sort of tacked this onto the research agenda as one of the many things for our institute to examine.

At the same time we were forming MOVES, the U.S. Army was moving into the defense/entertainment space in a big way. Colonel Casey Wardynski was interested in creating a virtual experience of a career in the U.S. Army using game technology. Researchers at the MOVES Institute, based in the Navy's premier educational institution, the Naval Postgraduate School, were ready to roll. MOVES was just the sort of environment Casey needed.

On the way ...

We explained to the Naval Postgraduate School we were going to build a game for Army strategic communication in support of recruiting. Sounds noble! We did not say we were going to build an entertainment product that was going to be the fastest growing online game of all time – we didn't know it ourselves at the time. We secured space at NPS and built a game-development studio inside our institute. By the time the *America's Army* team numbered twenty-five persons, they were pretty much hidden inside the sixty-eight total faculty and staff MOVES was paying. When you add on the seventy students we were working with institute-wide, the *America's Army* team was just a quiet part of a multi-million-dollar-a-year organization.

Well, the jig was up when *America's Army* came out. We had a hit

game on our hands. It was the fastest growing online game of all time from the get-go, making the news hundreds of times in twelve months. One hundred fan sites were created. Registered players exceeded 2.8M players. So we made way more noise than any other project in the MOVES Institute, and hiding our light under a bushel was impossible.

The future of defense modeling and simulation has a game face

We learned lots from *America's Army*. We learned that the project was pivotal in the future of defense modeling and simulation. Before *America's Army*, DoD was "kind of" interested in using games for training and experimentation. With *AA* produced inside the DoD tent, now nearly every group that requires training, experimentation, and analysis systems is thinking of building their next-generation system with a game face. How do we know? Because they are ringing our phones off the hook. As the only DoD game success, we are the experts on game usage.

People want their combat-modeling systems to be as easy to use as a commercial game, and as engaging. They are no longer content with Swiss-army-knife programs. They want their system bootable on a game console equivalent, to be able to hand a disk to a Marine and say, "insert disk, press start." They want to do experiments in a massively, multi-player online game (MMOG) and have play analyzed and displayed like the stats shown in any first-person shooter. They want their people to be their own analysts, and to build immersive training systems injected with the magic-learning sauce derived from our understanding of game development and creativity.

We have to help them get there – and reign them in when they are only fantasizing.

America's Army has changed our research directions. From 3D visual simulation to game-engine architectures, we will be helping our clients choose the right engine (whether commercial or open source), help them auto-generate artistic-looking visuals from real terrain sources, and guide them in selecting game technology for the web. We will evolve from networked virtual environments to MMOG architectures. We are moving from human-performance engineering to analysis of games and learning. Our DoD clients will create educational programs inside games; our research will add wireless and mobile devices and new consoles. We will go forward in computer-generated autonomy, modeling human and organizational behavior. We are well positioned for the future of defense modeling and simulation.

And that future has a game face.

Professor Zyda is the director of the MOVES Institute, the developers of America's Army. *He can be reached by email at zyda@movesinstitute.org*

21

Many S.F. team members are language specialists, as the player learns during the team-capability briefing, or "Gabriel."

The farther View

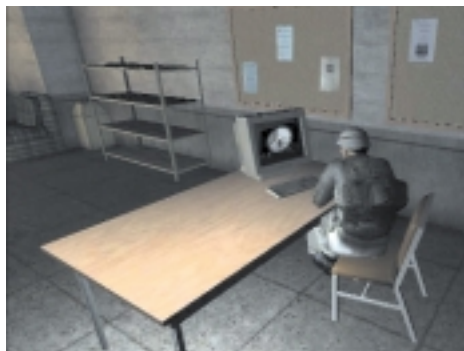## In the Heat of Combat: Special Forces Rescue

In the mission below, Special Forces fight alongside Indigenous Forces they have trained. For this mission, you must rescue and escort a wounded resistance leader who's escaped to a neutral hospital for treatment — or hinder the escape of a wounded enemy courier, depending which side you're on. We wanted the player to feel the grit and uneasiness of a volatile location in a sweltering desert city, nearing sundown. The warm, turbulent sky suggests the stifling, heavy air of an oncoming electrical storm. In the distance, lightning flashes and thunder rolls, adding to the tension.

This is one of a few modern, urban settings in the game, and the standard rules of engagement (ROE), become especially important, because civilians are involved. You must minimize harm to the local population and be especially careful to protect the hospital workers and facilities during this operation. Careless lobbing of grenades will almost certainly end in mission failure.

Phillip Bossant, *AA Art Director*

Fans and Clans

Who's Playing America's Army?

By Zhan Li, M.A.

The Army has recognized that computer games are not only increasingly mainstream entertainment, but also an important source of social and technical innovations. Thus they have welcomed the development of an open, online public space around the game, giving a tacit go-ahead to improvisation and player ownership by providing the usual online forum space, clan-building tools, and links to fan sites. While the Army does not meddle with clan attitudes or activity, the ethics and free-speech standards that are inextricable from *AA* encourage the self-policing of misbehavior by the player community. While gamers as a whole are an irreverent and escapist bunch, nevertheless serious matters receive due respect, and deeply meaningful exchanges are rather common.

Who are the fans? As it happens, though *America's Army* aimed for thirteen-to twenty-one year olds, the scatter hit a much wider target. The *AA* community includes many adults with a core constituency of a number of active-duty servicemen and veterans from all branches (and even from foreign militaries). With about fifteen hundred active-duty Soldiers wearing the in-game "Army star," the game creates a new channel for communication between Soldiers and the public they serve. Highly influential in shaping the fan culture, Soldiers and Vets are valued by civilian unit members as experts on military life.

America's Army units represent a novel civilian-military meeting place for players, Soldiers, and the Army proper, in which the role of individuals is not merely perfunctory or acquiescent. Veteran gamer clans (they prefer to be called "units") are active in asserting their own real-world agenda of veterans' affairs. During wartime, when members of these units are deployed, their *America's Army* community becomes a focus for care package and other support efforts through veteran gamer groups such as 1st Veterans' Battalion

25

Fan-made image entitled "True AAism: When an AAer is playing an AA character playing AA while battle rages behind him" (SoccerBoy)

(www.1st-vets.org), and Joint Task Force (www.jointtaskforce.net). These groups exemplify how the *America's Army* game space can support grassroots community activity that is both personally significant and divergent from the strict logic of the project.

In revealing the thoughts and motivations of those who play *America's Army*, the units provide a compelling overview of how the game represents the Army and what it stands for, and how people have embraced the game. The point is best made in the players' own words. The following quotations are taken from the voluminous postings of *America's Army* units and by query to individual members.

"Our group is a place to share our experiences of military life and to aid those having trouble with such. Our common bond of servitude, coupled with the experiences we've had, has also made us respected throughout the AA *community. And while we honor that response, we also enjoy helping the community, by making it more real for them as being with the 'been there, done that' crowd.*

"This game has become the catalyst of what brought us together. And with the contribution of all our members, 1st Veterans Battalion will continue to 'Serve those who Served.' Hooah!"
– a member of the 1st Veterans' Battalion (1VB)

"*Civilian 'clans' to me are just people coming together to game. Joint Task Force is a unit of people who come together for the camaraderie. The unit holds a special place in my life. I am the only female in JTF, and I am also a mother of four. But that doesn't change my feelings, it just gives me a place where because I am a veteran, I am an equal.*
– a member of the Joint Task Force (JTF)

"…You go solo, you don't go at all when it comes to America's Army. *This is the most powerful aspect I see in the game for gamers. Teenagers and twenty-year olds get a sneak peak at the army (very small, mind you) and through the site can learn more about the real thing…. What has the game done to me and my opinion about joining the Army? Directly, nothing. But I don't believe that was the intent, it opened up other avenues to help explore what the Army was and if it's for me. It was*

the spark that started the fire so to say, and at times the spark that relights the fire."
Morgan L. (age 16), USA

"I looked at the America's Army *game as a way to relax, and at the same time keep some of the demons away. You see, I have what is called PTSD [post-traumatic stress disorder], plus several other maladies from my tour in 'Nam back in '66–'67. [In 1VB, we] have quite a large number of members that were deployed either in Afghanistan, Iraq, or Bosnia. Many of our members have donated either funds or needed materials to send to our members and the others in their unit while deployed.*

"The membership is unlike anything I have come across before. You see, I am also a life member of the VFW, and DAV, I belong to the AMVETS, and have held office in ALL of them. The unquestioned camaraderie, closeness, and sense of family permeates not only the site, but also our members, their actions, and their purpose of being a member.

"We have had members that have had to confront some very serious real life situations, and every man, lady, comes together as one to lend whatever support is needed to assist this member in need for whatever amount of time it takes. You don't find that anywhere else on the Internet."
– 1VB member and Vietnam Veteran,
Mike Co. 3rd Bn 9th Marines '66–'67

"What makes [AA] so great is that it isn't just an aimless, kill everything! type game – it actually has objectives and teamwork… and never gets boring (Counter-Strike and other similar games get boring VERY soon).

As for how this relates to the REAL U.S. Army – well, I never really put that much thought into how U.S. Soldiers have to deal with rules of engagement and touchy situations like that all the time… in extreme peril, all to protect freedom. The game kind of lets you see the teamwork and cool-ness, but also the dangerousness, of the Army – things that you don't normally see or hear about…."
– Jon K. (age 14) CA, USA

"All of the members have in common that they have given time to their country. JTF wants to be a role model to our youth, to lend a helpful ear and communication that is missing in a lot of these youths' present lives."
– A player in the JTF

"It's a way cool game. I personally don't think it compares with any other in the world. I think people need to get away from games like Counter-Strike, *and get into the realms of this game. The realism is simply stunning. I dare to compare to any other in the world. The developers have worked hard on this aspect of the game, and it certainly shows through. The sound is also a wonder in itself…. I could go on forever. And the 'cool' factor is definitely there. It's popular with everyone! I especially like it how hand-guns were carefully integrated in v.2.0, and also how, unlike most games, you have ROE [rules of engagement]…."*
– Johnny (15 yrs old)

"The new map 'radio tower' [which involves the rescue of hostages] was almost a real-life scenario of what was going on over in

Baghdad and if I told you how much I played that scenario over and over … all the while CNN was on… I notched up playing time knowing there were [U.S.] POWs [in Iraq]…
well, first thing in all honesty I prayed to God for the safe recovery of all POWs and to grant them peace [until] I finally get over there to do some-thing... for some sick reason I wish I was over there trying to help or do something… people around me thought I was crazy… because their idea of a 'good life' is just sitting at home getting old and everything seeming to be safe. [These people are] letting others fight their battles."
– Art B, 25 years old, a player who enlisted in 2003 and attributes "seventy percent" of his motivations to his game-playing experiences. Interviewed only a few hours before catching the bus for boot camp.

"I want to write about how you guys helped me rebound from the funk I was in when I got home after being WIA [wounded in action]… this group of veterans and friends supported me while I was away with care packages and 'Hurry Homes.' Then, when I got home under the circumstances I did, I felt that I failed my troops by not being able to lead them home from Baghdad. You all were the best counselors and confi-dants I could have ever asked for…. You helped me realize that I was not alone and I could discuss the war with you and know that you wouldn't judge me for doing what a soldier has to do. The members of 1VB are much more than a group of gamers – we are patriots and brothers, held together by bonds forged in the blood and steel of the world."
– the founder of 1VB, who was wounded in action outside Baghdad during Operation Iraqi Freedom, 2003

Mr. Li was recently awarded a master's degree from the Massachusetts Institute of Technology, based on his thesis exploring the fan cultures of America's Army.

Weapons of Choice

All our in-game weapons are modeled accurately and with exacting detail. They function like real weapons, including reloading sequences, shell ejection, and the probability of malfunction. Soldiers who play AA are quick to point out the smallest inaccuracy, and we receive lots of compliments on how great they look and perform. You would never see weapons laid out like this in the game — they're always in use or holstered; but the gamers appreciate the artistry applied to our weapons modeling, and we've released several wallpapers showing the craftsmanship.

The sidearms below are M-9 pistols, which are used only by advanced marksmen in AA, though in the real Army they're also carried by Special Forces units, military police, and pilots. The magazine below has been removed from the upper weapon for reloading; the lower weapon's magazine is inserted into the base of the stock.

James Abney, *AA Designer/Programmer*

Weapons

One of the boons of being Special Forces is the freedom to modify your weapon through a variety of attachments. Options include heat shields, grenade launcher, scopes, iron sights, harris bipods, and muzzle suppressors. These attachments clip on to a picatinny rail system consistent with actual practice (see the gray bar on the SPR with the bipod at lower left). No other game offers anywhere near AA's range of options. Players may also select hand-painted camouflage according to mission terrain.

A variety of weapons is depicted below. OPFOR (opposing forces) weapons are carefully matched as to functionality with their U.S. equivalents.

Makarov PM

VSS "Vintorez"

SPR (U.S. special-purpose rifle)

AKS-74U with BS-1 silent grenade launcher

He Saw it coming

An Interview With Jack Thorpe

By Margaret Davis

Q: *Wired* **magazine has described you as a "connectivity visionary" and "the premier defense-department evangelist for synthetic environments." You're a legend in networked simulation, desktop simulators, video-arcade-style military trainers, and interactive history, as well as a retired Air Force colonel. What's your view of** *America's Army* **[***AA***]?**

JT: Without knowing the eventual form of it, researchers knew developments like *AA* would come. Key researchers in advanced distributed simulation [that is, very large number of computers hooked up on a network to share control and act together within the same virtual environment] have always believed their technology would expand into areas unforeseen by the original simulation pioneers.

Generally, the pioneers concentrated on three possible tracks: system development (such as designing and prototyping aircraft), training (e.g., flight training for undergraduate pilots); or operations research (producing, for example, large, constructive models of warfare). Other areas were not regarded as candidates for advanced, distributed, interactive simulations. Certainly recruiting was not.

Q: You stated that *AA* **was probably the most important thing to happen in modeling and simulation in two decades.**

JT: *AA* is the first significant departure from the mainstream applications that have, to date, been the justification for distributed simulation. *AA* is an innovative use of virtual environments to expose, inform, educate, and entertain citizens about military service. It has jumped the mainstream tracks and headed in a new direction.

Let me give a parallel. Amazon.com is revolutionary because you can bypass the sales clerk and get direct access to the warehouse database. You can see if the book you want is there, how long it will take to get to you, shipping options, and total cost. The customer is the proxy for the sales clerk, warehouse supervisor, and shipping clerk. The relationship between customer and business is redefined – and to the customer's advantage.

Similarly, *AA* revolutionizes recruitment, basic training, practice, and deployment because it puts users in control. They get to explore a previously hard-to-access topic, choose the direction they want to go, and see if it's attractive. They have access to information that was previously off limits.

This is a profoundly new model. It has trumped the traditional goals of simulation (better, cheaper, faster in the original application areas) and defined a new vector.

Q: *AA* **was designed for recruiting, but already people talk about training...**

JT: Yes, because the applications are all based upon the same core technologies. Whether you call it training, rehearsal, selection, or recruiting doesn't make any difference. It's a robust, flexible, environment that allows all sorts of uses – some planned by the developers, but others that are invented by creative users. That's what's powerful. As soon as you peel off the labels you realize how many different and interesting things are connected and can benefit from a common technical approach.

There's no question that people learn while "playing" *AA*, as with other games. As an example today, players working through the medical-skill qualification have to complete a portion of actual combat triage coursework. This would be valuable in a real emergency, in their own communities. Imagine, I'm playing a game and learning all sorts of things relevant to my daily existence as a human being on planet Earth. Nice.

Q: What doors are opening in the modeling and simulation world thanks to developments in *AA*?

JT: I think *AA* will push military simulation more effectively into commercial gaming, and then developments in gaming will be folded back into military simulation. The explosion four years ago in distributed multiplayer games – that is, virtual environments that host thousands of simultaneous players in the same space, interacting over the Internet – means *America's Army* is more sophisticated and relevant than many of our conventional simulation efforts.

Q: How will AA evolve?

JT: First of all, you realize that computers will be embedded in everything we do, so "games" will be everywhere. And whereas it might feel like you and I are playing a game, we might actually be executing something, controlling something, solving a real-world problem.

At the moment, *AA* replicates, perhaps, a tenth of your early Army experience; it shows how you start as a recruit, work through basic training, and get to advanced instruction in whatever military skill you choose. But in addition, Army personnel could adapt it to their needs. If I am a first sergeant at Ft. Hood, I will start using *AA* within my unit to do my training, or rehearsal, or whatever I am about. So the game started outside looking into the Army, but now becomes part of the real Army.

AA has taken its first step: modeling recruiting and several military specialties. The second step (already partly realized) is real Soldiers actually logging into the game and participating with me, so I'm

Mountain Pass Special Edition: Vast, icy ravines and snow-covered hills call for different strategies to accomplish objectives in this winter mountain mission. Soldiers fight in arctic gear using natural elements for cover.

getting data from real Soldiers and executing notional operations. Finally, the third step, which is admittedly a leap, is with proper authority, operating somewhere, anywhere in the information infrastructure to do particular tasks that are actually real-world tasks.

Example: UAVs [unmanned aerial vehicles] are flown over foreign combat areas while being controlled by operators thousands of miles away. Controllers make a control input, the real UAV responds. They can do this because the UAV and controller are part of the same information infrastructure, just like in a distributed game.

AA is the first relevant example in the 2000s of a radical rethinking of the way we do things. Not that we know exactly how it's all going to work – we're right at the edge of redefining the future within this age of massive, ubiquitous, easily accessible information. But we can use modeling and simulation to better understand what we want to do, given that they are advanced information technologies; and then, once we build a simulation (or game), we have not only the prototype for actually building a real system, we have the system itself. We knew this was coming. *AA* demonstrates how we go about it. That's why it's so important.

Dr. Jack Thorpe consults in the definition and planning of advanced technology development projects. He was program manager at the Defense Advanced Research Projects Agency (DARPA) that created the SIMNET simulator-networking project, micro-travel, desktop simulators, video-arcade trainers, interactive history, the electronic sand table, seamless simulation, the Defense Simulation Internet, and the "sixty-percent solution" development methodology. His research is described in Wired *magazine, March/April 1993 and April 1997.*

Dr. Thorpe served in the Air Force with twenty-six years active duty as an R&D officer, the last twelve as program manager and office director at DARPA. He retired in 1993 at the rank of colonel and remains involved in advanced technology projects.

Escape and Evade: Stealth Mission

To advance in Special Forces, the candidate undergoes many rigorous trials, including avoiding detection and capture in this stealth mission. The mood of the ordeal is concentrated and inward: the player is alone, with explicit orders to stay low and go slow, using ambient sounds to gauge the impact of his movements as he crouches and crawls through a maze of trees, hills, ravines and pools of water. The sound of crickets assures the player that he is indeed being stealthy. There is no run and gun here, only the intense scrutiny of watching eyes waiting to spot the player, should he allow himself to be seen.

The presence of water in any 3D real-time game underscores both the technological advances and limitations of the medium. We didn't want to stall the game for a gorgeous shot, so the immersive spell of this scene was accomplished largely by sleight of hand. But what's really on display here is AA's stylistic integrity – rather than show off with dazzling liquid-silver surfaces inconsistent with the rest of the environment, we kept the water somber and understated to maintain focus on the mission.

Phillip Bossant, AA *Art Director*

Special Forces fighting alongside indigenous forces

America's Arming

Digital memories, Real Bullets

By Wagner James Au

This is a glimpse of America's Army – from the front lines of modern combat, through the eyes of a Special Forces captain serving in Afghanistan. Two years later, this same Army Soldier would be fitted into a motion-capture suit, replicating the actions he performed in Afghanistan and in previous operations; modeling, for example, the distinctive, forward-leaning crouch that Special Forces commandos employ for room-clearing operations, or executing a fireman's carry, with another officer acting as wounded comrade.

Captain Amerine became a figurative and literal role model for the latest version of *America's Army* (*AA*), a computer game developed by the United States Army and the Naval Postgraduate School's MOVES Institute. Though the locations depicted in *AA* are generic, several missions are similar to those conducted recently by Green Berets: players go on missions where they lead a group of motley insurgents, for instance, or take reconnaissance photos of an enemy airfield, similar to what Captain Amerine's colleagues did outside Mazar-i-Sharif.

Strange as it seems, Amerine's mission in the motion-capture suit is also a glimpse, of a kind, from the front lines of modern combat. An educational and recruitment tool, *America's Army* is second only to the publicized exploits of Soldiers in the field in successfully fomenting a positive awareness of the Army among America's youth.

Why we fight?

This merger between military and interactive entertainment is exhilarating to some, especially now in wartime; and disturbing to others, again, especially in wartime. In a 2002 article for *Salon*, I compared *America's Army* positively to *Why We Fight*, Frank Capra's series of Army propaganda films from World War II. Taking a cue from iconoclastic thinkers like Christopher Hitchens and Paul Berman, I came to understand the post-9/11 era in the most essential terms: at heart, a conflict between democracy and totalitarianism. And a conflict with a cause that is – no matter what complaints one might raise against policymakers – just as morally unambiguous and urgent as that which the Allies waged during World War II. And just as that war demanded a

transformation in popular culture, we must consider whether contemporary culture must be similarly transformed – and if so, how today's digital technologies might be pressed into service.

There is of course the notion that a military-sponsored video game is tantamount to "pro-war" propaganda – and it's certainly one that's been leveled against *America's Army*. But upon further scrutiny, it's an odd criticism, or at best, inchoate. All but the most extreme pacifists acknowledge the need to maintain a national defense, and barring the draft, the only means to ensure a volunteer armed service is recruitment. As is often the case when it comes to military-related controversy, one senses emotional flailing more than anything rationally systematic: misdirected anger towards the armed forces. Calling a game that realistically portrays the Army in combat "pro-war" is like calling a game that realistically portrays firefighters trying to save a burning building "pro-fire." And surely any debate on policies of war should be brought before the politicians who enact these policies, as well as the electorate who elevated them—not to the military. Certainly, these debates have no merit against the game that serve to satisfy our mandate to maintain an all-volunteer Army.

But wherever one stands on the latitude of ideology, we'd better understand the lay of the digital landscape now, because it's a territory we'll be moving ever deeper into. What follows is a selective glimpse at the edge of that map – the territory where *America's Army* is now encamped.

Forces of Influence

The release of *America's Army* in May 2002 at the game industry's Electronic Entertainment Expo (E3) came only months after major combat operations in Afghanistan. Yet no explicit link is made between real-world operations and the virtual battlefields that Soldiers are deployed to. The terrorist combatants in the game are racially mixed and no mention is made of national origin or religious beliefs. This standard is also applied to the chat messages players send to each other while interacting with one another on *AA* game servers: slurs made against ethnic groups, religions, or even sexual orientation are grounds for immediate removal. Where multiplayer gamers often devolve into free-fire zones of hate speech, the Army runs one of the most politically correct games online.

In the same way and for similar reasons, the game is designed with an obsessive fealty to portraying combat as it is actually fought by American Soldiers. This realism is intended to make the game decidedly *not* propagandistic. "If you're going in there to be kill-crazy," says *AA* art director Phillip Bossant, "you're gonna get kicked out – and no other game does that." As virtual-reality pioneer Jack Thorpe puts it, if he really was the kind of warmongering official that conspiracy theorists imagine, "I'd be dismayed that the government is actually trying to paint a realistic picture." The game does not romanticize combat.

Of course, the game was not intended to be a dry simulation of U.S. military ethics. As a *game*, it has been a phenomenal success; as a *recruiting tool*, even more so. The marketing research firm I-to-I Tracker conducted a survey of American young people, asking them to list their reasons for a favorable impression of the Army (according to a recent Harvard study, the military is already the most respected institution among college students, trusted far above all others, public and private). In this survey, forty percent named recent operations in Afghanistan and Iraq for their favorable impression of the Army, while thirty percent – and this is extraordinary – named *America's Army*. In other words, the sense of the Army in America's youth is shaped almost as much by a simulation as by actual combat fought by real Soldiers. One wonders what to make of that. Pessimistically, it could mean the digital generation has lost the ability or desire to distinguish entertainment from news. Or possibly (and more optimistically), the game is working as intended, dramatizing what Army

values truly are and why our Soldiers are worthy of our trust.

While many in the Pentagon treated the first build of the game with a measure of arm's-length wariness, the latest version is very much a creature of current strategic policy. *AA* design has become directly related to the Secretary of Defense's theories on "transformation" – the high-tech merger between elite, front-line troops and the support network of air cover and cruise missiles instantly available by satellite phone and laser targeting. Specifically, the Department of Defense wants to double the number of Special Forces Soldiers, so essential did they prove in Afghanistan and northern Iraq; consequently, orders have trickled down the chain of command and found application in the current release of *America's Army*, which features Special Forces roles, missions, and equipment. A project that policymakers met with skepticism has become one of their most valued tools.

Shocked by awe

The rise of game-based reality is a phenomenon that Thorpe sees in *America's Army* – and welcomes. Not that we're also swerving toward a time when the simulation and the simulated are indistinguishable. "There is a kind of moral responsibility to separate the real from the imaginary, so you have accountability," as Thorpe puts it. Besides, their differences will always be too obvious. "Unless you have a set of Bose speakers and a 3000-watt amp," he says, "there's no mistaking a computer game with actually being in a combat situation, carrying forty or fifty pounds of equipment on your back; it really is fundamentally

The SPR or Special Purpose Rifle, is a modified M16A1 designed specifically for the Special Forces. The SPR will often be found in the hands of the 18B, the team's weapon specialist and designated marksman.

different… now these guys who are going to Baghdad can't take any of that [computer] stuff with them."

"Our purpose here is not to show the horror of war," says Bossant, "Our job is to show Army values." Still, he adds, "It's distressing to read things [in the news] that look so similar [to the game]. It's very sobering and saddening." *AA* executive producer Alex Mayberry is even more direct: "[These] are the realities of combat. In the game, it's always been our intent to present these realities as best we can." Seen this way, the Army's game is now tied to the success of its very real missions on these unforgiving fronts. If their reconstruction efforts devolve into quagmire, as some predict, then perhaps the public will begin to call the game a cruel distortion, and turn against it.

But if the Army can beat back the anarchy and in its place bring, as promised, burgeoning democracies, then maybe *America's Army* will be seen like the institution that inspired it: a depiction of all we value at our best and bravest, here in America and in the ever-expanding borders of peoples now free from tyranny and terror.

Wagner James Au is a game designer and freelance journalist and the "embedded reporter" for Second Life, *a massively multiplayer online game*

James Abney
Designer/Programmer

Michael Ambrogi
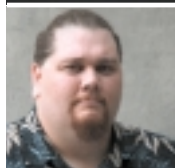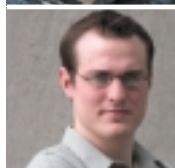*Animator*

Michael Aubuchon
Assistant Producer

Phillip Bossant
Art Director

Andrew Boulton
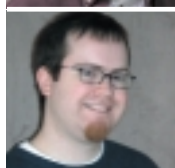*Intern Level Designer*

Christian Buhl
Lead Programmer
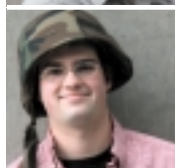
D. Evan Champlin
Artist

Christopher Chang
Artist

Scott Dossett
Lead Animator

Peter Ellis
Artist

John Gibson
Programmer

Joel Hunter
Programmer

LTC George Juntiff
*Design Consultant/
Operations Officer*
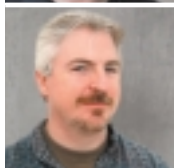
David Kozlowski
Assistant Webmaster

Mark Lewis
Level Designer
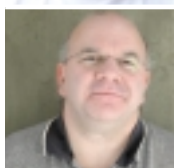
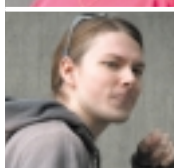**Jimmy Liberato**
Computer Specialist

Alex Mayberry
*Executive Producer/
Creative Director*

Jesse McCree
*Director of Development/
Lead Designer*
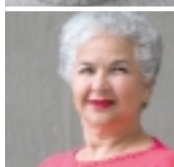
Rosemary Minns
*Production
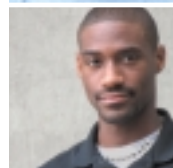Coordinator*

DJ Monkeyboy
Artist

Richard Nalezynski
Programmer

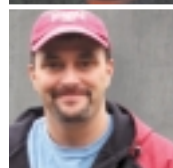**Gregory Paull**
Programmer

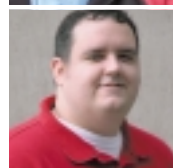**Niles Sankey**
Level Designer

Tavershima Shande
Artist

**Lieutenant
Commander
Russell Shilling, USN**
Audio Engineer

Matt Soares
*Associate Producer/
Designer*

Patrick Stone
Artist

Travis Wiglesworth
Level Designer

36

ENVIRONMENTS

Our game development philosophy is to suspend disbelief through immersion. We accomplish this in a number of ways. Solid game code and accurate weapon functionality ensure that movement and action in the game feel true. Our designers test game-play extensively throughout the level- and mission-creation process. Material properties of buildings, terrain, and objects give off the appropriate sound, hit effect, and damage mark. First-class game animation, a blend of motion capture and key framing, give the player a cinematic experience. We use a "painted reality" technique to hand paint all characters, weapons, and environments consistently to make the world and the game experience as seamless as possible. High-quality engineered sound design completes the experience.

Phillip Bossant, AA Art Director